



**US Army Corps  
of Engineers®**  
Engineer Research and  
Development Center

*Recreation Management Support Program*

## **Economic Impacts from Spending by Private Dock Owners at Hartwell Lake**

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Benoni L. Amsden, Wen-Huei Chang, and Richard Kasul

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Final report

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**Abstract:** This report documents the local economic impacts of private dock users at Hartwell Lake, located on the border of Georgia and South Carolina. This economic assessment is based on the results of a 1999 survey of a sample of Hartwell Lake private dock owners. Spending estimates are adjusted to 2004 dollars. The economic impacts estimated for Hartwell Lake are useful for accountability purposes, lake support, and explaining the role of the lake in the region's economy. This report demonstrates how the survey results can also be used to evaluate management alternatives and strategies and to conduct sensitivity analyses.

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## Summary

This report documents the local economic impacts of private dock owners and guests at Hartwell Lake, located on the border of Georgia and South Carolina and situated within the U.S. Army Corps of Engineers District, Savannah. This economic assessment is based on the results of a 1999 survey of a sample of Hartwell Lake private dock owners. Spending estimates are adjusted to 2004 dollars.

Given its centralized location in the eastern United States, plus its 962 miles of shoreline and nearly 56,000 surface acres, Hartwell Lake ranks as one of the top five most visited Corps of Engineers sites. Clemson University's location, adjacent to the lake, adds to Hartwell's attractiveness.

Total tourism activity in the three-state, 16-county region surrounding Hartwell Lake in 2002 was \$1.6 billion, or 2.9 percent of all economic activity in that region. Access to large bodies of water and their related resources, including scenic views, makes lakes such as this one desirable for the location of private homes and associated private boat docks. The Corps of Engineers permitted over 8,700 private boat docks at Hartwell Lake in 1999. The estimated 539,232 party trips taken by private boat dock owners/users in 1999 accounted for 16 percent of total recreation usage at the lake.

In 1999, private dock owners/users spent significant amounts of money in the local area, including \$57.4 million on trip-related items (gasoline, meals, lodging, etc.) and \$12.2 million on new boats, dock maintenance, insurance, and other annual services. Together, this \$69.6 million in spending in the 16-county region surrounding Hartwell Lake provides the economic base for \$44 million in direct sales, \$16.5 million in direct personal income (wages and salaries) for local residents, and 819 jobs in area tourism-related businesses. The \$44 million in direct sales is about 2.9 percent of the total of all tourism activity (\$1.6 billion) (sales have been price inflated for this computation). In 2004 dollars, these figures become \$69.5 million in trip-related expenditures and \$14.8 million in new boats and annual expenses. The added economic effects—in 2004 dollars—are \$53.5 million in direct sales and \$20 million in direct personal income.

The figures above are direct effects only of the \$69.6 million in dock owner/user spending in 1999. Another \$28.5 million in sales (\$34.5 million in sales in 2004 dollars) is generated through secondary effects, as dock owner/user spending circulates through the local economy. While the direct effects accrue primarily to the retail trade sector, restaurants, manufacturing (mainly because of the purchases of new boats locally), and services, secondary effects benefit a wide range of local businesses. The tourism sales multiplier for the region is 1.63, indicating there is \$0.63 in secondary sales for every dollar of direct sales.

Visitor segmentation is useful for planning purposes. This report provides results for the full sample of private dock owners/users and for dock owner segments that are useful for planning purposes: day use versus overnight stay dock owners and dock owners in three boat size classes. Day users comprised 57 percent of the sample of private dock users, while 43 percent spent at least one night in the area on their last trip. In terms of total spending in the local region, day users of private docks contributed 58 percent and overnight stay dock users, 42 percent. Nearly 29 percent of the sample had small-sized boats (17 ft and smaller), while 42 percent were medium (18 to 23 ft) and 29 percent were large (above 23 ft). Dock users with large boats contributed 32 percent of total spending locally, dock users with medium-sized boats, 45 percent, and those with small boats, 22 percent.

The economic impacts estimated for Hartwell Lake are useful for accountability purposes, lake support, and explaining the role of the lake in the region's economy. This report demonstrates how the results can also be used to evaluate management alternatives and strategies and to conduct sensitivity analyses.



## Preface

The work reported herein was undertaken for the “Measuring the Economic Effects of Boat Dock Permit and Marina Slip Holders” work unit of the Recreation Management Support Program (RMSP). The RMSP is funded by the Operations and Maintenance (O&M) General Appropriation and encompasses activities previously conducted through the Recreation Research Program and the Natural Resources Technical Support Program. The U.S. Army Engineer Research and Development Center (ERDC) provides program management support for execution of approved RMSP activities. The RMSP is managed at ERDC by Scott Jackson, Environmental Laboratory (EL). Kathleen Perales has served as Principal Investigator of the work unit since its creation in 1995.

This report documents a joint effort between ERDC and Michigan State University under contract with the United States Department of Agriculture to conduct lake level investigations on the economic spending patterns of visitors to communities, private boat docks, and marinas on U.S. Army Corps of Engineers (USACE) water resources projects.

A Recreation Leadership Advisory Team (RLAT) provides oversight for the RMSP. The team has representatives from each Major Subordinate Command/Regional Office within USACE. In addition, four district offices and four project offices are represented. Donald Dunwoody, RLAT representative from the Northwestern Division, served as proponent for this work unit.

This report was prepared by Benoni Amsden and Dr. Dennis Propst of Michigan State University under USDA contract. Dr. Wen-Huei Chang, ERDC, performed all economic impact analyses. Dr. LiChu Lee, ERDC, served to verify all data elements. Richard Kasul, ERDC, and Kathleen Perales, ERDC, were responsible for the design, instrumentation, sampling frame, and contract oversight. This work was conducted under the general supervision of Scott Jackson, Acting Chief, Ecological Resources Branch (ERB); Dr. David Tazik, Chief, Ecosystem Evaluation and Engineering Division (EEED); and Dr. Beth Fleming, Director, EL.

Peer reviewers of this report were Brad Keshlear, Recreation Program Manager, South Atlantic Division, USACE, and Melissa L. Wolf, Natural Resources Program Manager, Savannah District, USACE.

COL Richard B. Jenkins was Commander and Executive Director of ERDC. Dr. James R. Houston was Director.

## Foreword

This report represents one of nine market segmentation studies conducted at Corps of Engineers (Corps) water resources projects (lakes). The economic impact studies were conducted in 1999 and the information has been converted to 2004 dollars. It should be noted that no single study provides a complete portrait of any lake's boating market. The studies were limited to three market segments: marina slip renters, private dock, and community dock owners. These three groups do not reflect the spectrum of boating usage or market segments at any one of the lakes studied. The primary purpose of the studies was to obtain an understanding of these three market segments.

In addition to recreation usage, each of these segments is handled under different real estate instruments or shoreline use permit instruments. Marina slips (one boat per slip) are handled by the Corps through a lease agreement with the marina operator. Individual marina operators (lease holders) were involved in the development of contact lists for individual slip renters. Private dock owners (one dock permit, one household, potentially multiple boats) have a direct shoreline-use permit with the Corps and pay a fee. Community docks (one dock permit, multiple households, one boat per slip, a single household may hold multiple slips) are not tied to a single household but to a group of homes within a community. This permit type has a single point of contact (e.g. homeowner association). Typically the fee for a private or community dock permit is between \$30 and \$35 for 5 years. Additional administrative fees may also be collected to recover the cost of administration inspections and processing of permits. The cost is variable.

The lakes and market segments studied were:

- Table Rock Lake, community dock
- Rough River Lake, community dock
- Pomme de Terre Lake, community dock
- Harry S. Truman Dam and Reservoir, marina
- Raystown Lake, marina
- Hartwell Lake, private dock
- Lake Barkley, private dock

- Lake Sidney Lanier, private dock and marina

Each of the lakes studied has a variety of boating and water usage issues that were not a part of this economic impact evaluation. This economic impact assessed recreation visitor trip spending and annual durable goods-related expenditures. In order to provide managers with a tool to assess the effects of management, this report outlined the spending categories of boat owners and visitors associated with the recreational trip under study. Examples are provided illustrating changes in the number of boat trips and the changes that could be seen in economic impacts. These are provided as illustrations. The same illustration can be used by managers to help assess low water conditions and boating trips lost, to get a sense of the change in economic impacts. This study did not include the impacts of additional boats over time to determine changes in use, water quality, social or environmental impacts, or the like. This study did not include changes in use based on increases in gasoline prices or technological changes in boating products. These are elements outside the study parameters and would serve as useful points of departure for further research. These reports should be evaluated in part with the larger boating usage that occurs at the individual lake and the changes that have occurred over time (including expenditure changes such as the increasing cost of gasoline). They serve in part to document a baseline, which in part justifies publication at this late date.

For example, at a single lake, boating utilization should be evaluated within a larger context of the multipurpose mission of each of the lakes. To get an understanding of historical use and issues at Corps of Engineers facilities, the following documents have been recommended for further study: national and state regulations, project master-planning documents, shoreline management plans, environmental assessments, and other local studies. Consult the local project manager for an assessment of other documents that should be considered in addition to the ones provided.

# 1 Introduction

This report documents the local economic impacts of private dock<sup>1</sup> users at Hartwell Lake, located on the border of Georgia and South Carolina. These estimates are then adjusted to 2004 dollars. Economic impacts are measured as the direct and secondary sales, income, and jobs in the local area resulting from spending by those who use private docks. The economic estimates are produced using the Recreation Economic Assessment System (REAS) (Chang et al. 2001). Three major inputs to the model are:

- Number of visits broken down into day use/overnight segments and three boat size segments.
- Spending averages for each segment.
- Economic multipliers for the local region.

Inputs are derived from results contained in this report, the Natural Resource Management System (NRMS) database (U.S. Army Corps of Engineers (USACE) 2006c), and IMPLAN input-output modeling software (Minnesota IMPLAN Group 1996). The REAS model (USACE 2006a) provides a spreadsheet template for combining dock user visitation data, spending, and regional multipliers to compute changes in sales, personal income, jobs, and value added in the region.

## Hartwell Lake

Hartwell Lake was built at a cost of over \$89 million between 1955 and 1963 as part of a flood control, navigation, and hydropower project. The lake encompasses nearly 56,000 surface acres and 962 miles of shoreline (Figure 1). The lake is now a multi-purpose project with recreation, water quality, water supply, and fish and wildlife management as authorized uses.

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<sup>1</sup> Private docks: A private dock is one that serves only one property owner. These docks should be permitted under the authority of ER 1130-2-406 (USACE 1999). Do not include commercial docks or marinas.

Community docks: Community docks are privately owned, multi-slip facilities shared and used by several groups of people. These docks should be permitted under the authority of ER 1130-2-406. Do not include commercial docks or marinas (USACE 2006c).

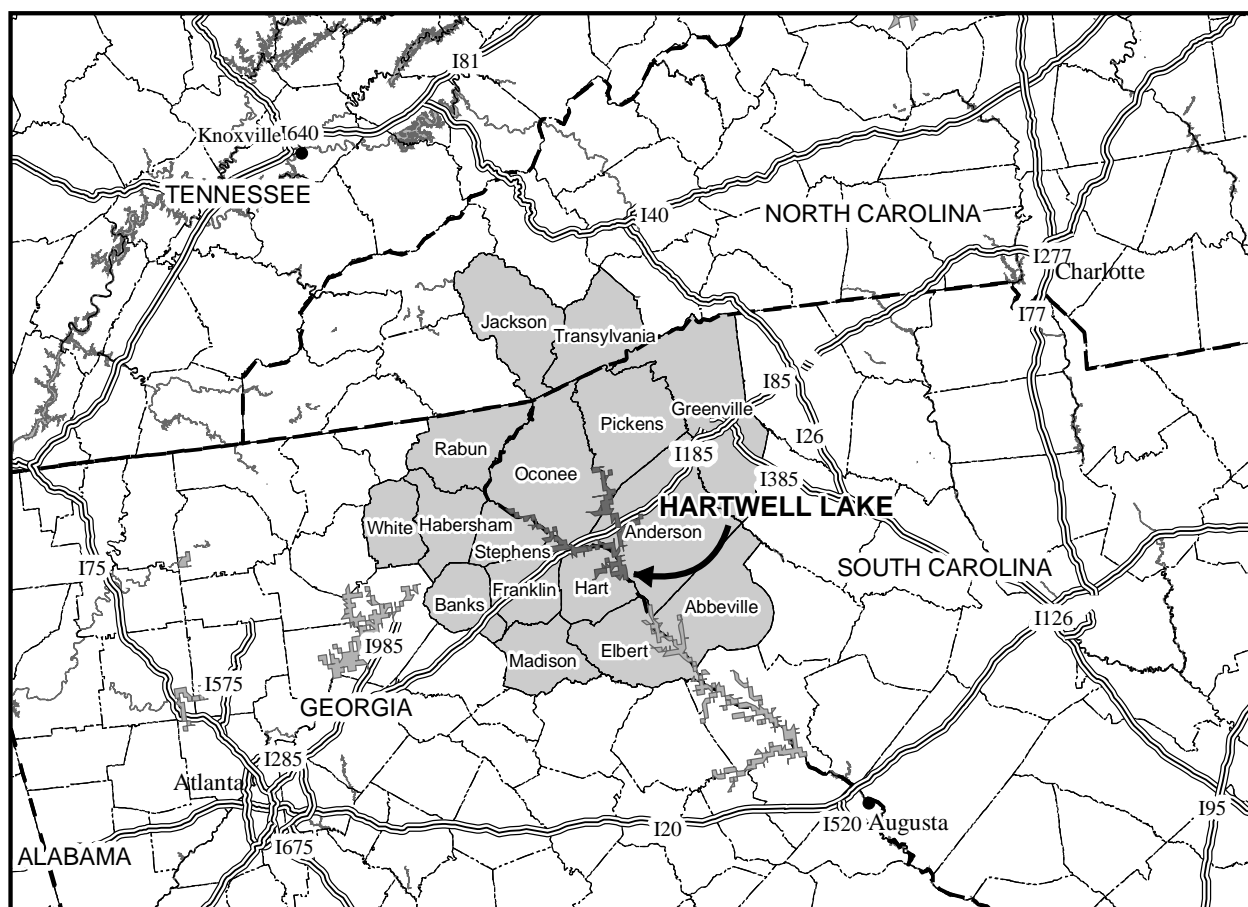


Figure 1. Hartwell Lake and the surrounding region.

Of the 87 recreation areas at Hartwell, the Corps operates 9 campgrounds, 15 major day use areas, and numerous boat launches and other lake access areas. In addition, the project includes five non-Corps of Engineers commercial marinas. Given its proximity to the mountainous region of three states (Georgia, North Carolina, and South Carolina), Clemson University and Interstates 26 and 85, Hartwell Lake (USACE 2006b) is located in an area of significant tourism activity. It is one of the top five most-visited Corps of Engineers lakes in the United States.

Hartwell Lake hosted over 10.1 million recreation visits in 1999, 96 percent of which were by day users (Table 1, top row). Non-boaters accounted for 6.5 million day use visits, and boaters another 3.2 million. Since visitor spending and economic impacts in this report are based on party-days or nights, these figures are shown on the bottom row of Table 1. In 1999, there were roughly 3.95 million party-days of recreation use.

Table 1. Summary of recreation visits to Hartwell Lake, 1999.

	Camper <sup>a</sup>		Day User <sup>b</sup>		Other Overnight <sup>c</sup>		Total
	Boat	Non-Boat	Boat	Non-Boat	Boat	Non-Boat	
Visits (Person-Trips, 1000s)	30.9	62.7	3,215.5	6,528.4	96.5	195.9	10,129.8
Average Length of Stay (Days)	4.2	3.8	-	-	2.4	3.0	—
Average Party Size	3.5	2.8	2.8	2.8	3.3	2.5	—
Visits (Party-Days, 1000s)	37.1	86.6	1,155.1	2,359.5	71.4	237.5	3,947.2
<p>a. Number of campers in <i>party days</i> was derived from the 1998 NRMS (USACE 2006c), CUR_FEE database (the last year that camper revenue data is available) by dividing total camping revenue by an average of \$8.00 per party day camping fee and expanding by the number of non-Corps managed campsites. The number of camper party-days was then adjusted to 1999 by multiplying the ratio of 1999 visits to 1998 visits from the PR_USE database. Then, party-days were converted to person-trips by the following formula: Number of campers in <i>person-trips</i> = number of party-days times average party size / average length of stay. Percent of boaters was obtained from the NRMS, PR_USE database. Party Size and Length of Stay figures are based on the results of a national survey (Chang et al. 2003).</p> <p>b. Number of day users in <i>person-trips</i> was derived from the 1999 NRMS (USACE 2006c), PR_USE database by subtracting camper visits from total visits. Then, number of day users in <i>party-days</i> = number of person-trips times average length of stay / average party size. Percent of boaters was obtained from NRMS, PR_USE database.</p> <p>c. Assumes that 3 percent of day users stayed overnight in lodging accommodations outside of project boundaries.</p>							

## The Local Region

Sixteen counties in Georgia, North Carolina, and South Carolina comprise the local economic impact study region for Hartwell Lake.<sup>1</sup> According to the U.S. Census Bureau (2006), the population of this area is 1,011,226 (1999) or 1,059,363 (2004 estimate). The average median household income of these counties is \$34,934 (1999), compared to the three-state average median of \$39,566 (1999).

The Manufacturing and Other Services sectors are major contributors to the economic base of the area, combining to account for 48 percent of sales, 31 percent of jobs, and 36 percent of employee wages in the 16-county region (Table 2). Other important sectors include Construction, Retail Trade, F.I.R.E. (finance, insurance and real estate), Bus Services, and Government, which combine to provide to the region 33 percent of its sales, 49 percent of its jobs, and 47 percent of employee wages.

<sup>1</sup> The local region consists of: *Georgia* - Banks, Elbert, Franklin, Habersham, Hart, Madison, Rabun, Stephens, White Counties; *North Carolina* - Jackson, Transylvania Counties; *South Carolina* - Abbeville, Anderson, Greenville, Oconee, Pickens Counties.

An estimate of total tourism sales in the region is \$1.6 billion (Table 2: 100 percent of hotel/motel + 100 percent of amusement & recreation + 25 percent of food services + 25 percent of retail sales + 25 percent of other amusements-gambling + 10 percent of groceries). Thus, tourism accounts for 2-3 percent of sales in the region and 6-7 percent of jobs.<sup>1</sup> In 2001, hotel sales in the area were \$142 million supporting nearly 3,000 jobs in the hotels/motel sector (Minnesota IMPLAN Group 2001).

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<sup>1</sup> An independent Travel Industry Association of America estimate of tourism activity in the same region for 2003 is \$1.2 billion, accessed from the following sources: Georgia.org Travel, Table 3.4: Economic Impact of Domestic Travel in Georgia by Region and County -2003 of "2003 County & Regional economic Impact Profile," Tourism Industry Research, <http://my.georgia.org/net/content/page.aspx?s=72591.72586.26.3011> (accessed April 28, 2006); South Carolina Department of Parks, Recreation and Tourism, Table E: Alphabetical by County, Revised 2003 of "The Economic Impact of Domestic Travel Expenditures on South Carolina Counties, 2004 – NEW REPORT," Research Report, <http://www.scprt.com/our-partners/tourismstatistics/researchreports.aspx> (accessed April 28, 2006); North Carolina Commerce, "County by County Economic Impact Statistics," Tourism Research, <http://www.nccommerce.com/tourism/econ/default.asp> (accessed April 28, 2006).

Table 2. Economic activity in the Hartwell Lake region, 2001.

Industry	Output (\$ millions)	Employment	Employee Compensation (\$ millions)	Value Added (\$ millions)	% Output
Agriculture	998.3	7,952.2	38.8	524.4	1.8%
Forestry/Fish	106.0	1,485.5	25.3	54.9	0.2%
Mining	120.9	633.6	26.8	57.0	0.2%
Utilities	1,419.1	7,137.1	373.9	874.4	2.5%
Construction	4,197.8	49,757.1	1,264.2	1,498.3	7.5%
Groceries	714.0	3,608.9	87.9	148.6	1.3%
Manufacturing	19,514.2	101,412.2	4,228.6	6,651.2	34.8%
Petroleum Refineries	0.0	0.0	0.0	0.0	0.0%
Sporting/Athletic Goods Manfng	164.5	955.2	39.8	55.5	0.3%
Wholesale Trade	2,270.3	19,133.0	827.8	1,512.4	4.0%
Transportation	1,398.8	12,161.9	462.6	708.3	2.5%
Retail Trade	3,503.2	71,458.9	1,463.4	2,121.4	6.2%
Communications	1,471.4	9,890.4	385.9	827.8	2.6%
FIRE	4,010.8	32,932.9	811.8	2,614.8	7.2%
Amusement & Recreation	134.9	6,216.0	65.7	99.9	0.2%
Bus Services	3,535.8	64,578.2	1,740.5	2,525.5	6.3%
Other Services	7,185.4	82,730.4	1,883.0	4,533.9	12.8%
Other Amuse- gambling/rec. ind	229.1	3,619.4	63.1	143.4	0.4%
Hotel/motel-incl. casino hotel	141.9	2,989.5	50.5	100.5	0.3%
Other Accommodations	126.5	877.9	16.3	43.8	0.2%
Food Services & Drinking Places	1,464.4	41,097.4	474.2	663.4	2.6%
Government	3,385.7	71,697.5	2,695.4	3,209.1	6.0%
<b>Total</b>	<b>56,092.9</b>	<b>592,324.8</b>	<b>17,025.5</b>	<b>28,968.6</b>	<b>100.0%</b>
Source: IMPLAN, 2001 county data files for the 16-county (SC/NC/GA) region.					



## **2 Private Dock Owner Survey, 1998-99**

The Ecological Resources Branch (ERB) of the U.S. Army Engineer Research and Development Center (ERDC) surveyed private dock owners at Lake Sidney Lanier (Georgia), Lake Barkley (Kentucky/Tennessee), and Hartwell Lake (Georgia /South Carolina). The ERB staff designed the survey, constructed the instrument, and provided the frame (a list of private dock owners) to the Institution for Public Policy and Social Research (IPPSR) at Michigan State University (MSU) for sampling. IPPSR obtained additional approval through MSU's Human Subjects Office. The Office of Management and Budget authorized this study (Institute for Water Resources (IWR) 2006).

Working with the project managers, the ERB obtained lists of private dock owners. Once the contact information was received, MSU IPPSR staff sent a pre-contact mailer to the dock owners in the sample. This information packet included a description of the study and a FAQ sheet for the private dock owner. In addition, the dock owners received a worksheet outlining the spending categories and other information regarding the upcoming telephone interview. Calls were made to dock owners in the randomly ordered sequence, until a quota of interviews was completed. In this manner, 318 randomly selected private dock owners were interviewed at Hartwell Lake, representing 4 percent of the total of 7,736 eligible private docks<sup>1</sup> at the time of the survey.

Spending and trip information were obtained through a Computer Assisted Telephone Interview (CATI) survey conducted by MSU IPPSR staff. The respondents were asked to document the number of boating trips on the lake that originated from their dock and to report trip spending associated with their most recent trip. Spending information was collected only for the most recent trip to reduce recall bias and avoid selective recall in which owners may report spending on the most expensive trips. The telephone interview lasted an average of 15 minutes. Other information needed to estimate parameters for this population was also acquired during the interview.

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<sup>1</sup>Number of private docks derived from 1998 NRMS data.

### 3 Results

Results are provided in four parts: respondent profiles (including socio-economic characteristics); recreation trip characteristics (amount of boat use, recreation activities and boat type); per-trip and annual spending; and the economic impacts of dock owners'/users' spending on the local region surrounding Hartwell Lake.

#### Respondent Profiles

The general characteristics of private dock owners as individuals and by households at Hartwell Lake are shown in Figures 2 to 11. In general, the private dock owners were mostly white males with high education and income. Among the respondents, 79 percent were male and 85 percent were aged 46 and above (Figures 2 and 3). The average age was 58 (range = 26 to 83 years old). The most frequent age (mode) was 61. Seventy percent of the dock owners had at least some college education and 45 percent had college degrees or more. Fifteen percent of Hartwell's private dock owners held graduate degrees (Figure 4). Almost all of the owners interviewed were white (Figure 5). All private dock slips have registered boats; surveys may or may not have been conducted with the registered boat owner. Ninety-six percent of the respondents were also the registered boat owner at the time of the interview (Figure 6).

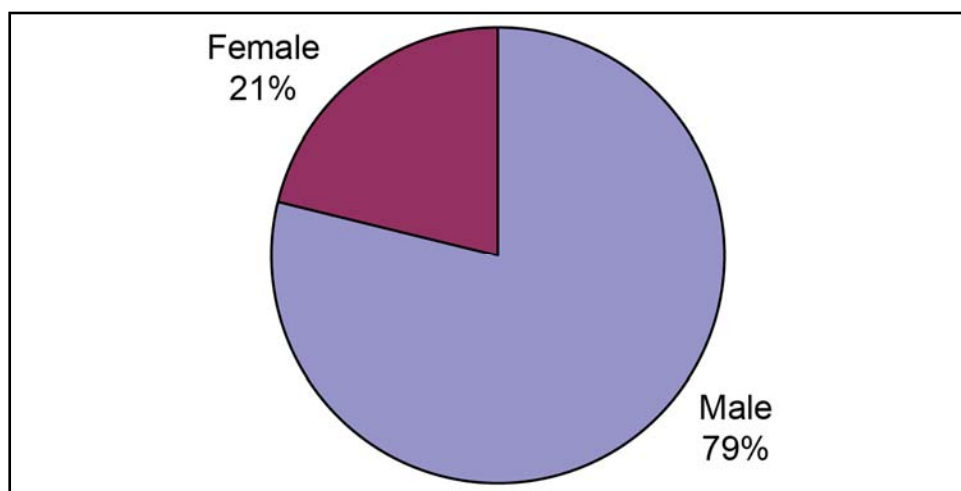


Figure 2. Gender of private dock owners at Hartwell Lake, 1999 (N=317).

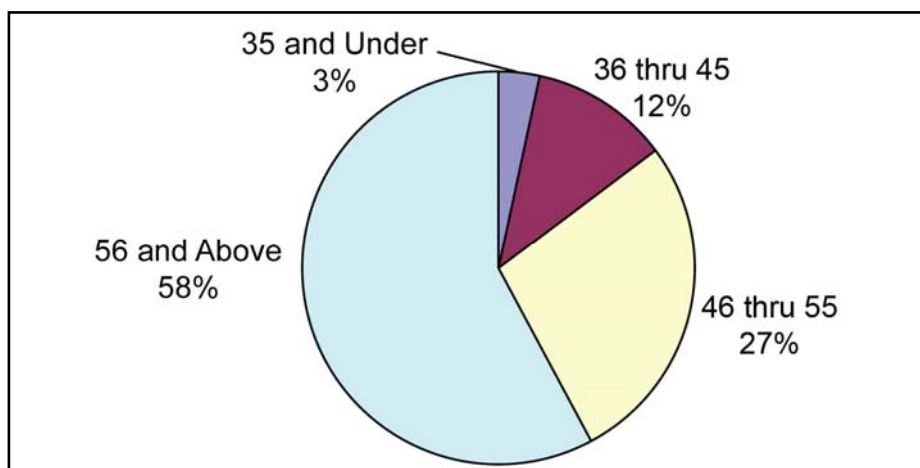


Figure 3. Age of private dock owners at Hartwell Lake, 1999 (N=311).

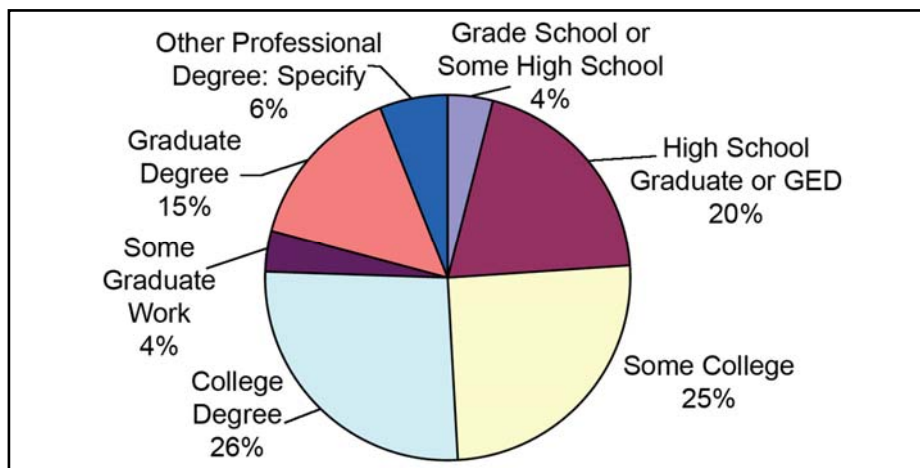


Figure 4. Education of private dock owners at Hartwell Lake, 1999 (N=314).

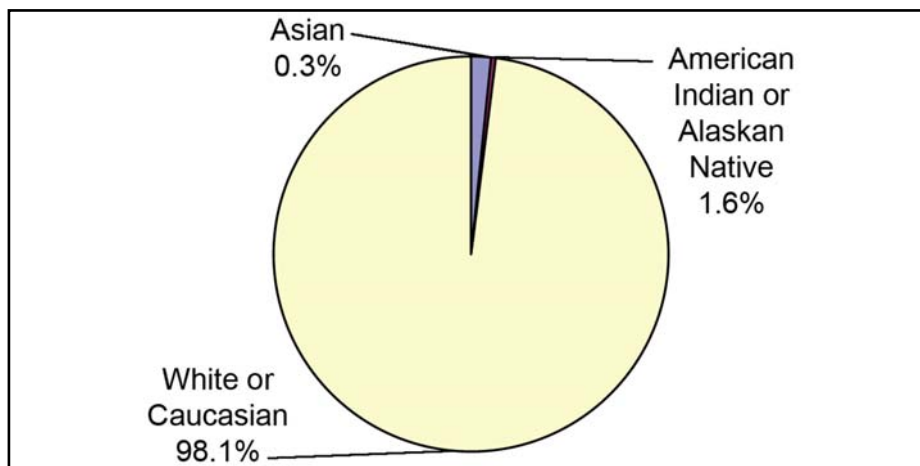


Figure 5. Race of private dock owners at Hartwell Lake, 1999 (N=311) (about 2 percent were Hispanic or of Latino origin).

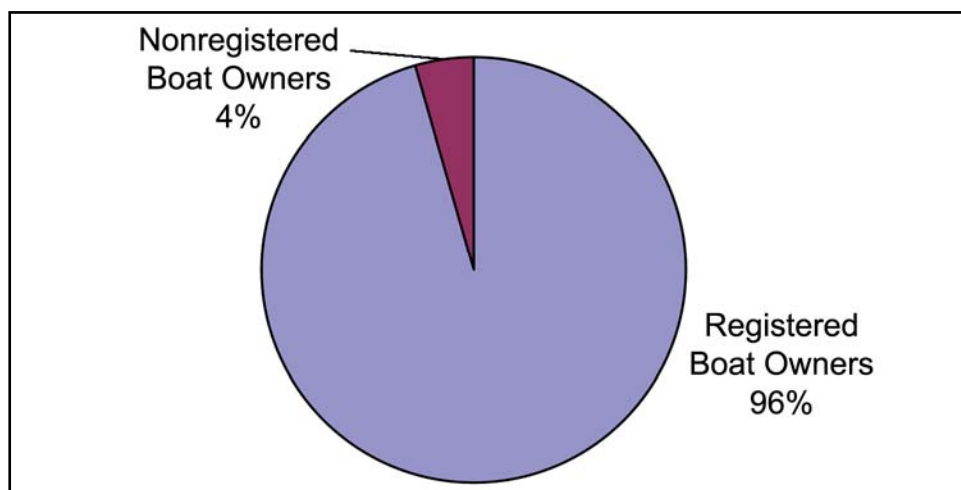


Figure 6. Survey conducted with registered boat owners at Hartwell Lake Private Docks, 1999 (N=316).

Many private dock owners reported high household incomes with no or few children living in the household. Forty-three percent of the respondents had annual household incomes of at least \$80,000, with 31 percent reporting incomes of over \$100,000 (Figure 7). More than half of the owners lived in a household with two or less people and 75 percent of the owners did not have any children under age 18 in their households (Figures 8 and 9). The average number of individuals per household was 2.8. The most frequent household size (mode) was 2.

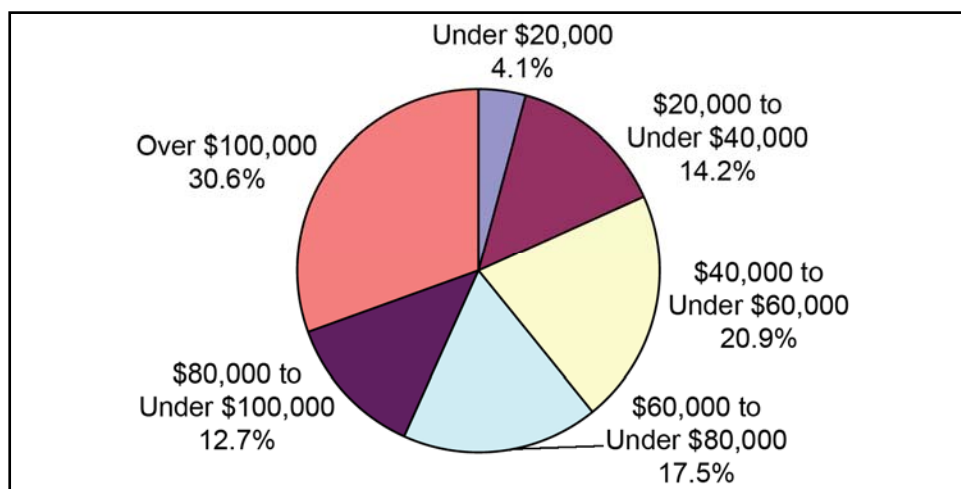


Figure 7. Household income of private dock owners at Hartwell Lake, 1999 (N=268).

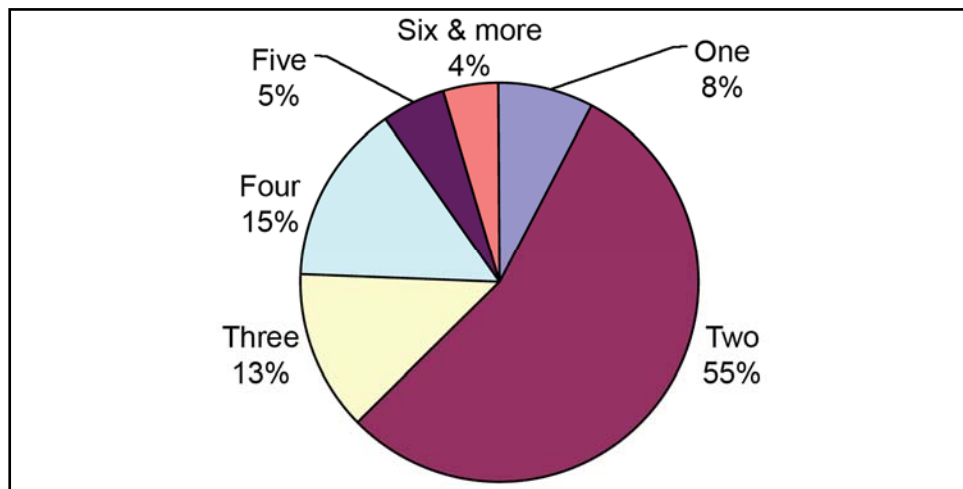


Figure 8. Household size of private dock owners at Hartwell Lake, 1999 (N=312).

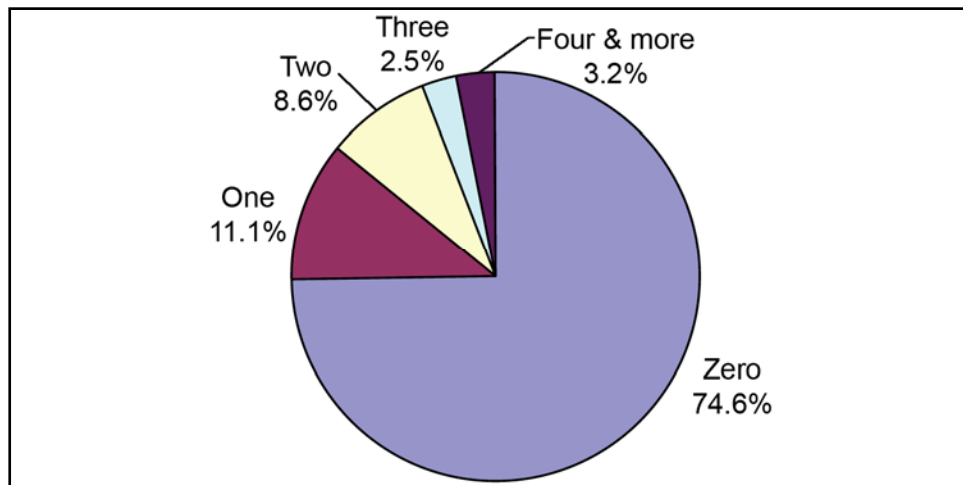


Figure 9. Number of people under 18 in households of private dock owners at Hartwell Lake, 1999 (N=315).

The permanent residences of 61 percent of the owners were within 30 miles of the dock (Figure 10). The average distance from the dock owner's permanent home to the dock was 46 miles. Forty-seven percent of the dock owners owned a seasonal home within 30 miles of the dock (Figure 11).

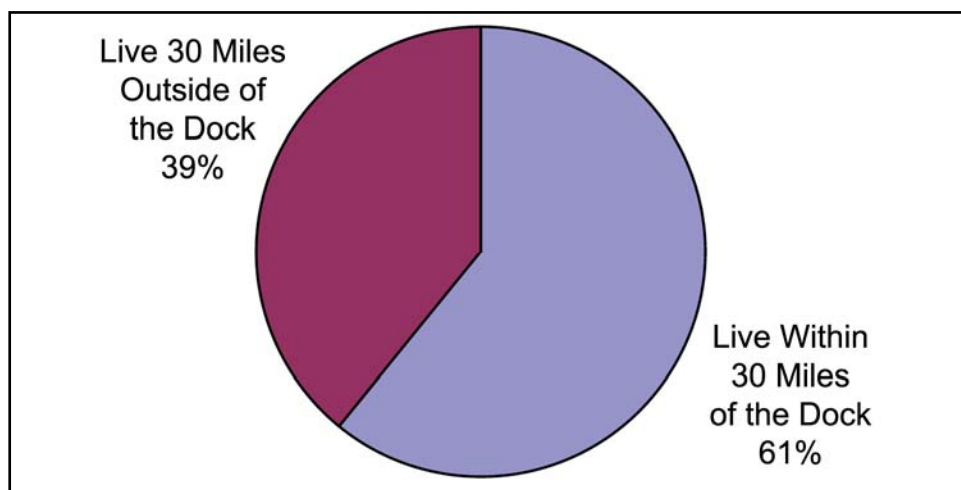


Figure 10. Permanent residence of private dock owners at Hartwell Lake, 1999 (N=317).

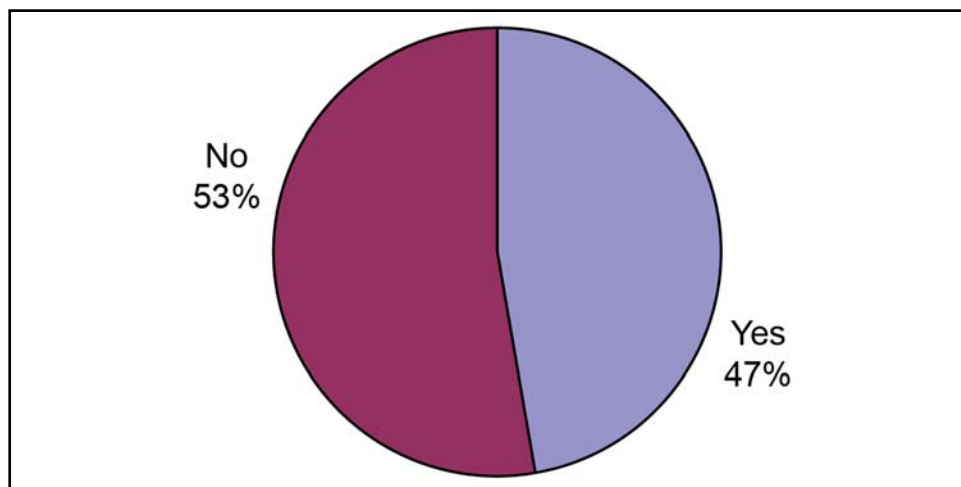


Figure 11. Seasonal home ownership of private dock owners at Hartwell Lake, 1999 (N=318).

## Boating Characteristics

Respondents had been boating on Hartwell Lake for an average of 16.8 years (range = 67 years). On average, they and their guests (owners/users) took 61.7 boating trips the previous year from September 1, 1998 to August 31, 1999.<sup>1</sup> Half of them made 28 or fewer trips and 25 percent made 60 or more trips in the same period (Table 3). The majority of trips were taken in the summer (25 trips), followed by spring (15 trips). On average, the fewest number of trips were made in the winter (about eight trips per dock owner). When asked to compare the number of boating trips made last year to the previous three years,

<sup>1</sup> Sixty-one percent of the sampled dock owners had permanent residences within 30 miles of their private boat dock. Therefore, a large proportion of trips are local in origin.

68 percent of the owners felt that they had made about the same number of boating trips. Nine percent said they had taken more trips last year than in the previous three years, and 23 percent said they had taken fewer trips (Figure 12).

Table 3. Number of trips to Hartwell Lake private boat docks the previous year (09/01/1998 to 08/31/1999).

	Average	Std. Error	Minimum	Maximum	Percentiles			
					25%	50%	75%	N
Total number of trips	61.69	4.82	0	365	12	27.5	60	300
Trips made in fall	13.04	1.22	0	150	2	5	12	294
Trips made in winter	8.27	0.94	0	100	0	2	9	294
Trips made in spring	15.04	1.25	0	110	2	6	15	292
Trips made in summer	25.02	2.08	0	180	5	10	27.5	292

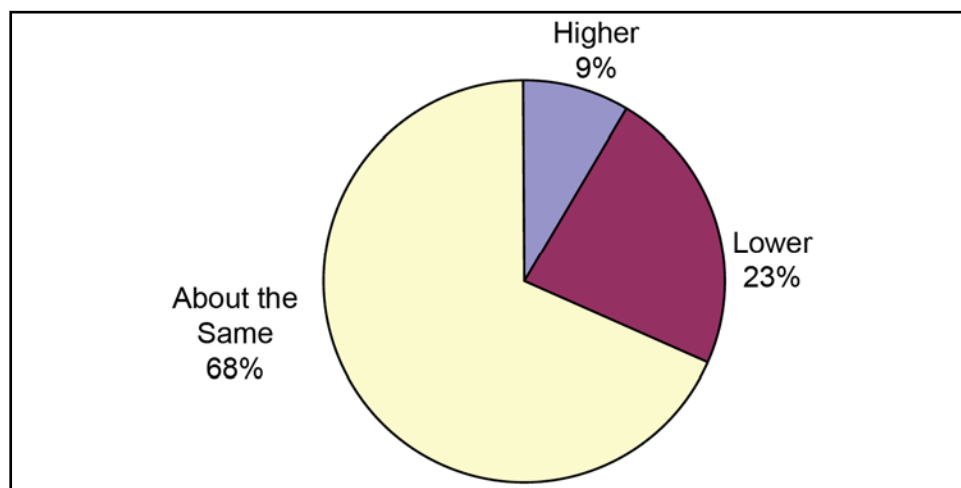


Figure 12. Number of boating trips made by private dock owners last year compared to previous 3-year average at Hartwell Lake, 1999 (N=278).

### Activities while boating

During their boating trips the previous year, dock owners/users went swimming during 34.7 percent of their trips for an average of 21 times across the year (Table 4). Other activities they participated in included fishing from boats (on 19.5 percent of their boating trips), picnicking (13.9 percent), and water skiing (13.7 percent). The participation rates for scuba diving, hunting, and camping were all less than 1 percent of the total boating trips. Thirty-two percent of the dock owners/users reported participating in other activities that were not mentioned during the

telephone interviews (Figure 13). On average, dock owners/users participated in other activities 9 times during 14.7 percent of their boating trips the previous year (Table 4). The most frequent other activities were other nonwater activities (6 percent of respondents), tubing/wave running, cruising/pleasure boating/touring lake, and sightseeing (4 percent each) (Figure 13).

Table 4. Recreation activity participation during previous year's trips to Hartwell Lake private boat docks (09/01/1998 to 08/31/1999).

Activity	Mean <sup>1</sup>	Percent of total trips <sup>2</sup>	Std. Error of mean	Minimum	Maximum	N
Boating	33.53	54.36%	2.90	0	300	259
Swimming	21.40	34.68%	1.87	0	240	260
Picnicking	8.55	13.85%	1.14	0	156	260
Fishing from boat	12.04	19.51%	2.07	0	270	262
Water skiing	8.44	13.69%	1.03	0	100	262
Camping	0.41	0.66%	0.11	0	20	263
Hiking	2.07	3.36%	0.39	0	48	261
Fishing from shore	5.89	9.54%	0.73	0	100	261
Scuba diving	0.05	0.09%	0.03	0	5	263
Hunting	0.22	0.36%	0.11	0	25	262
Other Activities	9.03	14.65%	2.17	0	365	259

<sup>1</sup> Times participated in listed activity during previous year's boating trip.

<sup>2</sup> Times participated in the listed activity divided by total number of boating trips made the previous year.

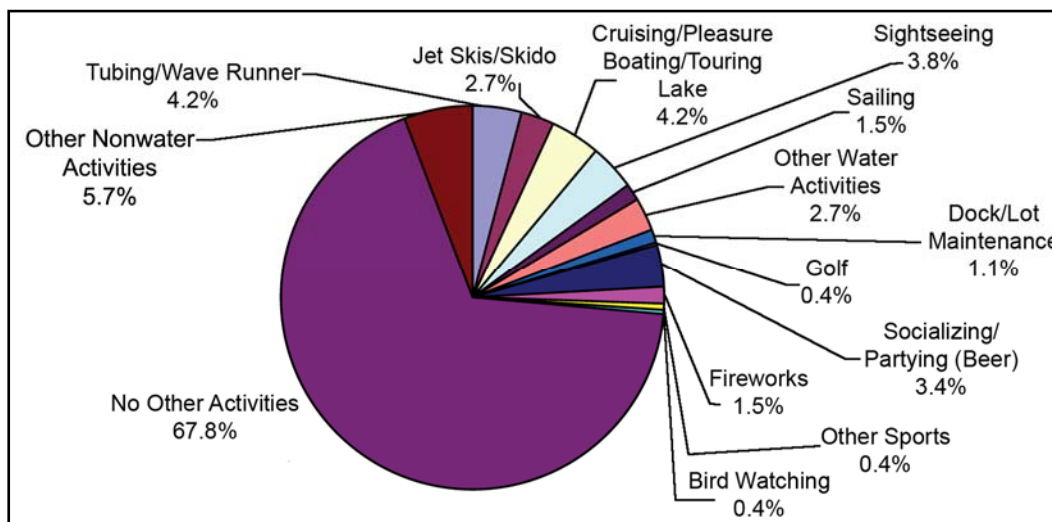


Figure 13. "What other activities did you or others participate in during your boating trips last year that I have not already mentioned?" (from Hartwell Lake Private Docks, 1999, N=261).



### Type of boat and motor

Twenty-nine percent of the boats surveyed at Hartwell Lake private docks were 17 ft and under with a minimum of 5 ft (Table 5). Forty-two percent were 18 to 23 ft long, and 29 percent were 24 ft and larger, with a maximum of 60 ft. Cabin cruisers, pontoons, and house boats were mostly 24 ft and larger.

Table 5. Boat type and length cross-tabulation, Hartwell Lake private dock owner survey, 1999 (N = 271).

Boat Length	Boat Type						Total
	Open	Cabin	Sailboat	Pontoon	House	PWC	
17' and smaller	21.77%	0.00%	1.11%	1.11%	0.00%	5.17%	29.15%
18' to 23'	23.25%	0.74%	1.11%	16.61%	0.00%	0.00%	41.70%
24' and larger	1.85%	1.11%	0.74%	24.35%	1.11%	0.00%	29.15%
<b>Total</b>	<b>46.86%</b>	<b>1.85%</b>	<b>2.95%</b>	<b>42.07%</b>	<b>1.11%</b>	<b>5.17%</b>	<b>100.00%</b>

Seventy-eight percent of the boats used at private docks did not include inboard motors. The majority of houseboats had inboard motors, while most pontoons, open boats, and sailboats did not (Table 6). In general, the largest boats (24 ft and longer) had the lowest percentage of inboard motors (Table 7).

Table 6. Boat type and motor cross-tabulation, Hartwell Lake private dock owner survey, 1999 (N = 245).

In-Board Motor	Boat Type						Total
	Open	Cabin	Sailboat	Pontoon	House	PWC	
With	14.29%	0.82%	0.82%	3.27%	1.22%	2.04%	22.45%
Without	34.29%	0.82%	2.45%	36.33%	0.00%	3.67%	77.55%
<b>Total</b>	<b>48.57%</b>	<b>1.63%</b>	<b>3.27%</b>	<b>39.59%</b>	<b>1.22%</b>	<b>5.71%</b>	<b>100.00%</b>

Table 7. Boat length and motor cross-tabulation, Hartwell Lake private dock owner survey, 1999 (N = 242).

In-Board Motor	Boat Length			Total
	17' and smaller	18' to 23'	24' and larger	
With	7.02%	9.92%	5.79%	22.73%
Without	23.55%	30.58%	23.14%	77.27%
<b>Total</b>	<b>30.58%</b>	<b>40.50%</b>	<b>28.93%</b>	<b>100.00%</b>

## **Dock user segments and spending**

Spending averages were estimated for all of Hartwell Lake's private dock users (Table 8) and for two different segments based on length of stay (Table 9) and boat length (Table 10). Dividing visitors into segments helps explain differences in spending across distinct user groups. It gives managers the opportunity to apply these distinct spending profiles to project level use data. The two types of segments that fulfilled these purposes were: day user versus overnight stay segments and segments based on length of the boat.

### **Average spending for full sample of dock owners**

Private dock users averaged \$136 in trip expenses associated with their last boating trip (for a party of 4.1 people). Dock users stayed away from home an average of 1.4 nights and used their boat 1.7 days during their last trip (Table 8). Seventy-nine percent (\$106) of spending occurred within 30 miles of the boat dock. Of the expenditures made within 30 miles of the dock, dock users spent the most on groceries (\$26 per party trip), followed by gas and oil for the boat (\$19), restaurant meals (\$18), and other boat expenses (\$12). A refined average of 61.5 boating trips was made from each slip in a private dock during the previous year.

**Table 8. Summary of Hartwell Lake private dock owners'/users' spending and use profiles, 09/1998 to 08/1999 (spending per party trip).**

Spending Categories	Mean	Std. Error	Pct. Error <sup>1</sup>	N	Minimum	Maximum	Pct. zeroes	Mean exc. zero
<b>Spending Information for Last Trip</b>								
Gas/oil auto	\$10.00	\$1.34	13%	308	\$0	\$200	59%	\$24.45
Other expenses auto	\$2.32	\$1.22	53%	312	\$0	\$300	96%	\$55.69
Gas/oil boat	\$18.54	\$1.23	7%	306	\$0	\$150	16%	\$22.16
Other expenses boat	\$11.84	\$3.62	31%	311	\$0	\$654	89%	\$108.32
Food/drink restaurants	\$18.27	\$2.14	12%	314	\$0	\$300	63%	\$49.90
Groceries	\$25.94	\$2.73	11%	308	\$0	\$350	46%	\$48.12
Campground fees	\$0.99	\$0.42	42%	314	\$0	\$98	96%	\$28.27
Lodging	\$1.58	\$0.92	59%	314	\$0	\$250	99%	\$123.75
Recreation fees	\$4.43	\$1.52	34%	314	\$0	\$300	96%	\$107.08
Sporting goods	\$6.80	\$2.01	30%	312	\$0	\$400	88%	\$55.82
Other supplies	\$5.76	\$0.90	16%	311	\$0	\$150	71%	\$19.69
<b>Total within 30 miles</b>	<b>\$106.48</b>							
Expenses for 30+ Miles <sup>2</sup>	\$29.06	\$4.88	17%	189	\$0	\$500	60%	
<b>Total trip spending</b>	<b>\$135.54</b>							
Pct. of local spending (within 30 miles)	78.56%							
<b>Use Information for Last Trip</b>								
Nights away from home	1.36	0.14	10%	310	0	21		
Days used boat	1.67	0.09	6%	268	1	20		
Number of people on boat	4.11	0.20	5%	271	1	35		
<b>Annual Spending for Last Year (09/01/98 - 08/31/99)</b>								
Storage fees	\$71.63	\$15.01	21%	248	\$0	\$2,040		
Insurance payments	\$195.12	\$12.43	6%	198	\$0	\$1,500		
Boat repair/maintenance	\$206.06	\$32.74	16%	243	\$0	\$5,000		
Dock maintenance/repair	\$357.55	\$58.40	16%	269	\$0	\$6,000		
<b>Use Information for Last Year (09/01/98 - 08/31/99)</b>								
Number of trips using boat	61.49	4.84	8%	299	0	365		
Cost of the boat (in 1999 dollars)	\$15,791	\$1,386	9%	227	\$380	\$212,274		
<sup>1</sup> Pct. Error = Std. Error / Mean. Two standard errors yield a 95-percent confidence interval.								
<sup>2</sup> Expenses outside 30 miles of the private dock on last trip.								

A private dock is permitted under a shoreline use permit. The applicant is charged a \$30.00 fee for a 5-year permit, which includes a \$10.00 administration charge and a \$5.00 annual inspection fee. Other storage fees that are identified in annual spending do not include the permit fee

but relate to additional spending that may be paid by the end user, for example in off-site storage when the craft is not in the water.

Dock owners spent an average of \$72 on storage fees, \$195 on insurance, \$206 on boat repair and maintenance, and \$358 on dock repair and maintenance (Table 8). The average cost of the boat was \$15,791 (1999 dollars). The lowest boat cost was \$380 and the highest was \$212,274.

When asked to compare the amount they spent on their most recent trip to prior similar trips, 76 percent of the dock owners felt that they had made about the same expenditures. Ten percent said they had spent more on the most recent trip than on similar trips in the past 12 months, and 14 percent said they had spent less (Figure 14).

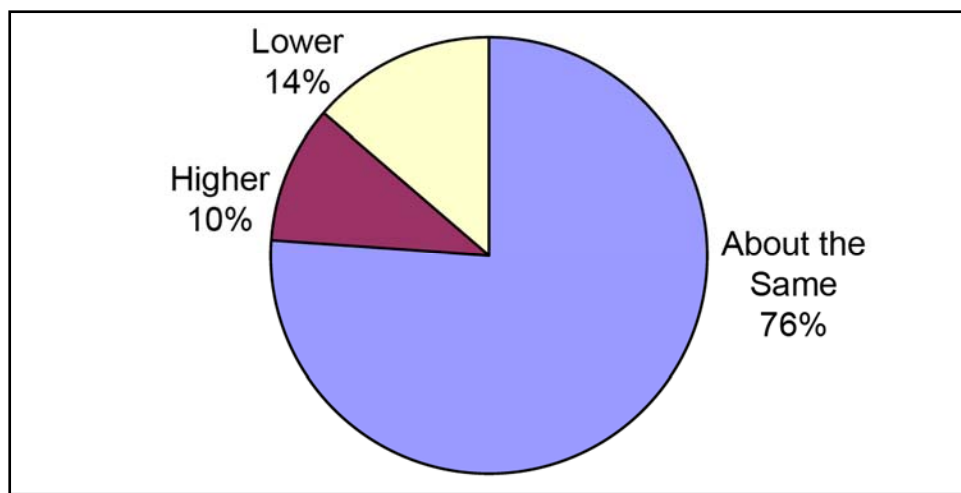


Figure 14. Expenditures by private dock owners/users on most recent trip compared to similar trips in the last 12 months at Hartwell Lake, 1999 (N=293).

Many of the respondents reported no spending on their last trip in many of the spending categories listed. Categories in which a large percentage (more than 80 percent) of users did not spend money on their last trip were: lodging (99 percent), campground fees (96 percent), other expenses on autos (96 percent), recreation fees (96 percent), other expenses on boats (89 percent), and sporting goods (88 percent). Although the estimates of average trip expenditures in this report are based on the full sample, it is worthwhile to recognize the difference between the average spending of all private dock users and average spending of just the spenders. The average spending of those who spent something on an item is generally much higher than the average computed from all visitors. For instance, while the average across all dock users was \$1.58 on lodging per

party trip, the four dock parties who did spend money on lodging spent an average of \$124 per party trip (Table 8). For estimating total spending of all Hartwell Lake private dock users, it is appropriate to apply the means that include zeros. The means without zeros should not be used to expand the data to population totals, as they represent spending for specific segments only (i.e., dock users who stayed in hotels spent an average of \$124 on lodging per trip).

#### **Average spending by segment: Day use versus overnight**

Hartwell dock owners were grouped into two segments based on whether or not they stayed overnight away from their permanent home during their last trip. The dock owners/users who did not stay away from home (i.e., day users) spent an average of \$73 for that trip, 85 percent (\$62) of which was spent within 30 miles of the boat dock (Table 9). The average party size was 4.1 people per trip. The dock owners/users who stayed overnight spent an average of 3.2 nights away from home and used the boat for 2.5 days with a party size of 4.3 people per trip. They spent an average \$211 for the entire trip, 79 percent (\$167) of which was spent within 30 miles of the boat dock. Day users made an average of 86 boating trips in the previous year, whereas overnight dock users made 31 trips.

Table 9. Spending and use by length of stay segments, Hartwell Lake private dock owner survey, 09/1998 to 08/1999 (spending per party trip).

Spending Categories	Day users				Overnight users			
	Mean	Std. Error	Pct. Error <sup>1</sup>	N	Mean	Std. Error	Pct. Error <sup>1</sup>	N
<b>Per Party Trip Spending</b>								
Gas/oil auto	\$2.36	\$0.62	26%	174	\$20.18	\$2.85	14%	128
Other expenses auto	\$0.14	\$0.12	84%	175	\$5.23	\$2.88	55%	131
Gas/oil boat	\$14.73	\$1.36	9%	169	\$23.79	\$2.18	9%	131
Other expenses boat	\$12.74	\$4.85	38%	175	\$11.09	\$5.65	51%	131
Restaurants	\$10.36	\$2.34	23%	176	\$29.42	\$3.81	13%	132
Groceries	\$9.06	\$1.66	18%	172	\$48.40	\$5.46	11%	131
Campground fees	\$0.00	—	—	176	\$2.36	\$0.98	42%	132
Lodging	\$0.00	—	—	176	\$3.75	\$2.19	58%	132
Recreation fees	\$2.17	\$1.74	80%	176	\$7.65	\$2.76	36%	132
Sporting goods	\$5.94	\$2.66	45%	175	\$8.25	\$3.22	39%	131
Other supplies	\$4.94	\$1.25	25%	174	\$7.05	\$1.34	19%	131
<b>Total within 30 miles</b>	<b>\$62.44</b>				<b>\$167.17</b>			
Expenses 30+ Miles <sup>2</sup>	\$10.85	\$6.39	59%	80	\$43.63	\$6.94	16%	106
<b>Total trip spending</b>	<b>\$73.29</b>				<b>\$210.80</b>			
Pct. of local spending (within 30 miles)	85%				79%			
<b>Annual Spending</b>								
Storage fees	\$80.51	\$24.76	31%	137	\$57.40	\$14.03	24%	106
Insurance payments	\$178.34	\$14.29	8%	110	\$219.01	\$21.98	10%	85
Boat repair/maintenance	\$185.73	\$36.91	20%	134	\$222.11	\$59.66	27%	104
Dock maintenance/repair	\$420.85	\$91.12	22%	149	\$282.49	\$68.36	24%	114
Cost of the boat (in 1999 dollars)	\$17,578	\$2,287	13%	122	\$13,911	\$1,431	10%	100
<b>Visitor Characteristics</b>								
Total trips using boat (last year)	86.27	7.82	9%	164	31.38	3.66	12%	131
Nights away from home (last trip)	0.00	—	—	177	3.17	0.26	8%	133
Days used boat (last trip)	1.00	—	—	150	2.51	0.19	8%	113
People on boat (last trip)	4.05	0.28	7%	147	4.27	0.28	6%	118
<sup>1</sup> Pct. Error = Std. Error/Mean. Two standard errors yield a 95% confidence interval. <sup>2</sup> Expenses outside 30 miles of the private dock on last trip.								

Unlike similar studies at other Corps lakes, dock owners in the day use segment owned more expensive boats than overnighters (\$17,578 versus \$13,911, respectively). The overnight segment of dock owners paid more annually in insurance payments, and boat repairs and maintenance than day users. However, day users spent more on storage fees and dock maintenance.

Day users comprised 57 percent of the sample of private dock users, while 43 percent spent at least one night in the area on their last trip. In terms of total spending in the local region, day users of private docks contributed 58 percent and overnight stay dock users, 42 percent.

#### **Average spending by boat length segments**

Based on the length of the boat, the dock owners were grouped into three segments: boats that were 17 ft and shorter, boats between 18 and 23 ft, and boats 24 ft and longer. The amount of expenditures was somewhat similar across all three segments. The 17-ft and smaller segment spent an average of \$147 per party on the last trip during which about 76 percent (\$111) was spent within 30 miles of the boat dock (Table 10). They stayed an average of 1.8 nights away from home and used their boat for 2.1 days with a party size of 3.3 people per trip. Dock users in this segment made an average of 52 boating trips the previous year.

**Table 10. Spending and use by boat length segments, Hartwell Lake private dock owner survey, 09/1998 to 08/1999 (spending per party trip).**

Spending Categories	17' and smaller				18' to 23'				24' and larger			
	Mean	Std. Error	Pct. Error <sup>1</sup>	N	Mean	Std. Error	Pct. Error <sup>1</sup>	N	Mean	Std. Error	Pct. Error <sup>1</sup>	N
Per Party Trip Spending												
Gas/oil auto	\$10.37	\$1.65	16%	77	\$8.29	\$2.04	25%	109	\$8.92	\$2.05	23%	76
Other expenses auto	\$0.48	\$0.27	55%	77	\$1.22	\$0.92	76%	111	\$6.82	\$4.67	0%	78
Gas/oil boat	\$21.95	\$2.73	12%	77	\$19.65	\$1.78	9%	107	\$20.85	\$2.75	13%	79
Other expenses boat	\$14.78	\$7.18	49%	77	\$7.22	\$3.36	46%	109	\$18.81	\$11.40	0%	79
Restaurants	\$17.85	\$3.48	20%	78	\$19.90	\$3.56	18%	110	\$21.52	\$5.76	27%	79
Groceries	\$31.92	\$5.45	17%	77	\$30.38	\$5.94	20%	108	\$20.87	\$3.70	18%	78
Campground fees	\$0.19	\$0.14	72%	78	\$2.35	\$1.15	49%	110	\$0.00	—	—	79
Lodging	\$0.83	\$0.83	100%	78	\$3.36	\$2.51	75%	110	\$0.76	\$0.76	0%	79
Recreation fees	\$2.18	\$1.42	65%	78	\$8.82	\$3.76	43%	110	\$3.19	\$2.61	0%	79
Sporting goods	\$3.55	\$1.35	38%	78	\$5.58	\$2.93	52%	110	\$7.86	\$4.12	0%	77
Other supplies	\$7.14	\$2.19	31%	78	\$6.05	\$1.45	24%	110	\$5.80	\$1.88	32%	79
Total within 30 miles	\$111.24				\$112.82				\$115.39			
Expenses 30+ miles <sup>2</sup>	\$35.55	\$9.49	27%	56	\$21.98	\$5.15	23%	64	\$38.75	\$13.85	36%	48
Total trip spending	\$146.79				\$134.80				\$154.14			
Pct. of local spending (within 30 miles)	76%				84%				75%			
Annual Spending												
Storage fees	\$56.37	\$15.89	28%	73	\$121.19	\$35.26	29%	96	\$28.99	\$12.28	0%	69
Insurance payments	\$184.60	\$20.87	11%	58	\$192.67	\$14.39	7%	83	\$214.60	\$33.42	16%	52
Boat repair/ maintenance	\$154.15	\$40.74	26%	72	\$177.61	\$40.95	23%	95	\$321.21	\$94.19	29%	66
Dock maintenance/ repair	\$309.07	\$105.82	34%	73	\$299.74	\$82.88	28%	95	\$412.60	\$117.96	29%	67
Cost of the boat (in 1999 dollars)	\$8,924.14	\$714.37	8%	68	\$15,110.61	\$800.10	5%	93	\$24,718.14	\$4,585.83	19%	63
Visitor Characteristics												
Total trips using boat (last year)	51.60	7.39	14%	77	72.19	9.40	13%	103	72.08	10.03	14%	77
Nights away from home (last trip)	1.78	0.33	18%	76	1.03	0.15	14%	109	1.30	0.27	21%	79
Days used boat (last trip)	2.08	0.28	13%	77	1.55	0.09	6%	112	1.38	0.09	6%	74
People on boat (last trip)	3.26	0.23	7%	77	4.11	0.27	7%	111	5.00	0.50	10%	78
<sup>1</sup> Pct. Error = Std. Error/Mean. Two standard errors yield a 95% confidence interval.												
<sup>2</sup> Expenses outside 30 miles of the private dock on last trip												



The 18- to 23-ft boat segment spent an average of \$135 per party on the last trip (\$113 within 30 miles of the boat dock). They stayed an average of one night away from home and used their boat for 1.6 days with a party size of four people per trip. They made an average of 72 boating trips the previous year. Owners/users in the largest boat size segment averaged more than \$154 per party on goods and services during their last trip, (\$115 of the money was spent locally). They stayed away from home an average of 1.3 nights and used the boat for 1.4 days per trip. The average party size for this group was five people per trip. Owners/users in this segment made an average of 72 boating trips the previous year.

In general, the larger the boat, the more dock owners spent on annual expenses. Dock maintenance and repair ranged from \$309 for boats 17 ft and shorter to \$413 for boats 24 ft and longer. The cost of the boat ranged from \$8,924 for the 17-ft and shorter segment to \$24,718 for the 24-ft and longer segment, while the insurance payments ranged from \$185 to \$215. Boat repair and maintenance costs similarly grew from \$154 to \$321 per year as boat size increased (Table 10).

Nearly 29 percent of the sample had small-sized boats (17 ft and smaller), while 42 percent were medium (18 to 23 ft) and 29 percent were large (above 23 ft). Dock users with large boats contributed 32 percent of total spending locally; dock users with medium-sized boats, 45 percent; and those with small boats, 22 percent.

### **Total spending**

The figures in Table 11 were derived from secondary data sources, the Natural Resource Management System (NRMS) (USACE 2006c) and from survey data for Hartwell (e.g., average number of trips per household or dock permit last year). Applying these figures, Hartwell dock users took 539,232 boating party trips in 1999 (16 percent of total recreation use),<sup>1</sup> and purchased 357 new boats (Table 11).

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<sup>1</sup> 10.1 million recreation visits in 1999 from Table 1 divided by an average party size of 3.0 from Propst et al. (1998) equals 3.38 million total party trips; 539,232 is 16 percent of 3.38 million party trips.

**Table 11. Total annual use figures for private dock owner survey at Hartwell Lake (1999).**

Category	Total Use	Computation Procedures
Number of docks	8,741	From NRMS (1999)
Number of boats	9,527	From NRMS (1999)
Number of party trips	539,232	Total party trips (from Table 3) times total number of docks (assuming the total number of trips is on a per dock basis, reference Foreword)
Percent of new boats purchased last year	4.08%	Computed from survey results, using the 3-year average (1997 to 1999)
Number of new boats purchased last year	357	Percent of new boats purchased last year times total number of docks

Local and total trip-related spending (Table 12 and 13) is calculated by multiplying the number of party-trips in Table 11 (539,232) by the trip spending averages in Table 8. Total spending on boats and fixed, annual goods and services (Table 14) is estimated by multiplying the number of docks in Table 11 (8,741) by the annual expenditures on boats, dock repairs and maintenance, and storage in Table 8. Total spending on insurance is estimated by multiplying the number of boats (9,527) by the proportion of local boat dock owners who purchased boat insurance and their average insurance payment. Total spending on purchasing new boats is estimated by multiplying the number of new boats purchased last year (357) by the proportion of local dock owners who bought new boats and the average local new boat cost for three years: 1997-1999.

A recreation visit, as reported in the NRMS database, is one person entering a Corps project. Spending depends on how long a person stays in the local region rather than how many times they enter the project or how much time they spend in recreation activities while there. Recreation visits are therefore converted to party trips<sup>1</sup> in the region before applying spending averages. This procedure avoids double counting the spending of private dock users who may enter the project multiple times on the same day and also takes into account additional days a dock user may spend in the area outside the project.

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<sup>1</sup>See Table 11 for the conversion steps. A party is a travel group staying in the area (within 30 miles of the dock). The travel group is usually all individuals in the same vehicle or on the same boat or staying in the same room or campsite. During the interviews, dock owners were asked to report expenditures for their entire party for the last trip. Thus, the units for expenditures are party trips. Converting visits to party trips assures that the units are the same in the multiplication steps that lead to estimates of total expenditures (visits in party trips times expenditures in party trips).

The estimated trip spending for all Hartwell private dock users in 1999 was \$57.42 million within the local region (Table 12). If trip spending outside 30 miles is included, the total rises to \$73.09 million (Table 13). Only trip spending within 30 miles of the boat dock (\$57.42 million) should be included when conducting economic impact analysis at the project level (multi-county region).

**Table 12. Total trip spending in local area<sup>1</sup> by Hartwell Lake private dock owners/users (1999).**

Spending Categories	Spending (\$MM)
Gas/oil auto	\$5.39
Other expenses auto	\$1.25
Gas/oil boat	\$10.00
Other expenses boat	\$6.39
Food/drink restaurants	\$9.85
Groceries	\$13.99
Campground fees	\$0.53
Lodging	\$0.85
Recreation fees	\$2.39
Sporting goods	\$3.67
Other supplies	\$3.11
<b>Total trip spending</b>	<b>\$57.42</b>
<sup>1</sup> Local trip spending equals spending within 30 miles of the dock.	

Table 13. Total trip spending<sup>1</sup> by Hartwell Lake private dock owners/users (1999).

Spending Categories	Spending (\$MM) <sup>2</sup>
Gas/oil auto	\$7.46
Other expenses auto	\$1.73
Gas/oil boat	\$10.00
Other expenses boat	\$6.39
Food/drink restaurants	\$13.62
Groceries	\$19.33
Campground fees	\$0.74
Lodging	\$1.17
Recreation fees	\$3.30
Sporting goods	\$5.07
Other supplies	\$4.29
<b>Total trip spending</b>	<b>\$73.09</b>
<sup>1</sup> Total trip spending equals spending within and outside 30 miles of the dock. <sup>2</sup> Dock owners were asked to report trip spending outside 30 miles of the private dock as one total amount, not broken down by item as this table shows. This aggregate spending figure was then proportionally distributed into all but two categories based on the spending proportions within 30 miles. Proportional allocations were not made to the “gas/oil boat” and “other expenses boat” categories. It was assumed that, for these two categories, there were no boating expenditures outside 30 miles of the private dock.	

Fixed, annual goods and services related to boating activities in this study were new boats, dock repairs and maintenance, storage fees, insurance, and boat repairs and maintenance. Hartwell’s private dock owners spent \$12.23 million (1999 dollars) on boating-related annual goods and services (Table 14). Forty-five percent of the money was spent on purchases of new boats (\$5.6 million), followed by dock maintenance and repair (\$3.1 million), boat repair and maintenance (\$1.8 million), insurance payments (\$1.1 million), and storage fees (\$630,000).

**Table 14. Total spending on fixed, annual goods and services by private dock owners at Hartwell Lake (1999).**

<b>Spending Categories</b>	<b>Spending (\$MM)</b>
Storage fees	\$0.63
Insurance payments (include only payments from dock owners who lived within 30 miles of the private dock)	\$1.13
Boat repair/maintenance	\$1.80
Dock maintenance/repair	\$3.13
Purchases of new boats (within 30 miles)	\$5.55
<b>Total durable goods spending</b>	<b>\$12.23</b>

## **Economic impacts of dock user spending**

### **1999 impacts**

The \$57.4 million in trip-related spending from Table 12 had a direct economic impact on the region of \$36.4 million in direct sales, \$13.6 million in personal income (wages and salaries), and supported 701 jobs in the region (Table 15). The eating and drinking (restaurants and bars) sector received the largest amount of direct sales (\$9.9 million), followed by the retail sector (\$9.7 million).

Table 15. Regional economic impacts of Hartwell Lake private dock owners'/users' trip spending (1999, for trip spending within 30 miles only).

SUMMARY RESULTS TABLE IMPACTS ON LOCAL ECONOMY				
Economic Measure		DIRECT	Multiplier	TOTAL
Output/sales (\$MM)		\$36.44	1.63	\$59.55
Total income (\$MM)		\$13.55	0.59	\$21.36
Total value added (\$MM)		\$19.30	0.90	\$32.75
Jobs		700.56	27.17	990.26
Total visitor spending (\$MM)			57.42	
Capture rate			63%	
Effective spending multiplier			1.04	
Direct Effects				
Sector	Sales (\$MM)	Income (\$MM)	Value Added (\$MM)	Jobs
Lodging	\$1.38	\$0.59	\$0.97	30.14
Eat & drink	\$9.85	\$3.96	\$4.46	290.22
Amusement and recreation	\$1.74	\$0.81	\$1.17	42.11
Retail	\$9.73	\$4.09	\$5.46	223.86
Wholesale	\$5.50	\$2.09	\$3.67	48.72
Other services	\$3.41	\$0.82	\$1.34	31.92
Groceries	\$0.66	\$0.10	\$0.19	3.68
Sporting goods	\$0.00	\$0.00	\$0.00	0.00
Other manufacturing	\$4.13	\$1.06	\$2.03	29.61
Government	\$0.04	\$0.02	\$0.02	0.32
Total	\$36.44	\$13.55	\$19.30	700.56
Total Effects				
Sector	Sales (\$MM)	Income (\$MM)	Value Added (\$MM)	Jobs
Lodging	\$1.55	\$0.65	\$1.07	33.18
Eating & drinking	\$10.74	\$4.32	\$4.87	316.47
Amusement and recreation	\$2.02	\$0.94	\$1.35	51.56
Retail	\$11.76	\$5.02	\$6.68	268.17
Wholesale	\$7.01	\$2.67	\$4.67	62.06
Other services	\$17.79	\$5.67	\$10.46	198.03
Groceries	\$1.33	\$0.22	\$0.39	7.98
Sporting goods	\$0.00	\$0.00	\$0.00	0.00
Other manufacturing	\$6.99	\$1.77	\$3.07	50.51
Government	\$0.35	\$0.11	\$0.20	2.31
Total	\$59.55	\$21.36	\$32.75	990.26

Direct effects are less than total spending, as only the retail and wholesale margins on visitor purchases of goods accrue to the local economy. The local region surrounding Hartwell Lake captures 63 percent of dock user spending. Thirty-seven percent leaks out of the local economy to cover the costs of imported goods bought by visitors.<sup>1</sup>

The sales multiplier<sup>2</sup> for the region is 1.63, meaning that an additional \$0.63 in sales is generated through secondary effects for every dollar of direct sales. Secondary effects generate an additional 290 jobs, for a total of 990 direct and secondary jobs (Table 15). Likewise, secondary effects generate an additional \$7.8 million in personal income and \$13.5 million in value added (personal income + proprietor's income + indirect business tax). Roughly 12 direct jobs are supported by each \$1 million in total dock user spending. Including multiplier effects, each \$1 million in total dock user spending supports about 17 jobs.

The \$12.2 million in spending on new boats, storage fees, insurance, and repairs/maintenance from Table 14 had a direct economic impact on the region of \$7.8 million in direct sales, \$3.0 million in personal income (wages and salaries), and supported 118 direct jobs in the region (Table 16). The manufacturing sector received the largest amount of direct sales (\$4.3 million), followed by other services (\$ 1.8 million).

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<sup>1</sup> For example, if a visitor buys \$50 worth of clothing that is not manufactured in the local region, only the local margins (retail and locally operated wholesale and transportation), say \$30, will be captured by the local economy as direct sales. The remaining \$20 will leak immediately outside the local economy to cover the produce price (or price of good at the factory), and non-local margins (wholesale and transportation).

<sup>2</sup> Multipliers for the 16-county region are from a 2001 input-output model estimated with the IMPLAN system.

Table 16. Regional economic impacts of Hartwell Lake private dock owners' durable goods and annual spending (1999).

SUMMARY RESULTS TABLE IMPACTS ON LOCAL ECONOMY				
Economic Measure		Direct	Multiplier	Total
Output/sales (\$MM)		\$7.80	1.69	\$13.17
Total income (\$MM)		\$2.99	0.63	\$4.89
Total value added (\$MM)		\$3.73	0.89	\$6.90
Jobs		118.44	23.89	186.27
Total visitor spending (\$MM)			12.23	
Capture rate			64%	
Effective spending multiplier			1.08	
Direct Effects				
Sector	Sales (\$MM)	Income (\$MM)	Value Added (\$MM)	Jobs
Lodging	\$-	\$-	\$-	—
Eating & drinking	\$-	\$-	\$-	—
Amusement and recreation	\$-	\$-	\$-	—
Retail	\$1.62	\$0.58	\$0.79	43.47
Wholesale	\$0.07	\$0.03	\$0.05	0.63
Other services	\$1.76	\$0.48	\$0.82	12.29
Groceries	\$-	\$-	\$-	—
Sporting goods	\$-	\$-	\$-	—
Other manufacturing	\$4.34	\$1.90	\$2.07	61.95
Government	\$0.01	\$0.00	\$0.00	0.11
Total	\$7.80	\$2.99	\$3.73	118.44
Total Effects				
Sector	Sales (\$MM)	Income (\$MM)	Value Added (\$MM)	Jobs
Lodging	\$0.04	\$0.01	\$0.02	0.63
Eating & drinking	\$0.19	\$0.08	\$0.09	5.67
Amusement and recreation	\$0.05	\$0.02	\$0.03	1.37
Retail	\$2.18	\$0.84	\$1.14	55.86
Wholesale	\$0.36	\$0.14	\$0.24	3.26
Other services	\$5.30	\$1.73	\$3.05	52.82
Groceries	\$0.04	\$0.01	\$0.01	0.21
Sporting goods	\$0.00	\$0.00	\$0.00	0.00
Other manufacturing	\$4.93	\$2.05	\$2.28	65.94
Government	\$0.08	\$0.02	\$0.04	0.53
Total	\$13.17	\$4.89	\$6.90	186.27



Direct effects only accrue to industries where private dock owner spending is directly received. For example, since no money is spent in the Lodging sector from dock owner annual and durable goods spending, that cell is blank in the top sector of Table 16 (direct effects). However, other companies receiving direct payments (e.g. insurance companies) may hire employees who live in the region and spend money in the local Lodging sector. Since this is a multiplier (secondary) effect upon the Lodging sector, some sales appear in the Lodging cell in the total effects sector of Table 16.

The local region surrounding Hartwell Lake captures 64 percent of private dock owner spending on new boats and annual services. Thirty-six percent leaks out of the local economy to cover the costs of imported boats and services bought by visitors.

The sales multiplier for the region is 1.69, meaning that an additional \$0.69 in sales is generated through secondary effects for every dollar of direct sales. Secondary effects generate an additional 68 jobs, for a total of 186 direct and secondary jobs (Table 16). Likewise, secondary effects generate an additional \$1.9 million in personal income and \$3.2 million in value added (personal income + proprietor's income + indirect business tax). Roughly 10 direct jobs are supported by each \$1 million in total dock owner spending for new boats and annual services. Including multiplier effects, each \$1 million in total dock owner spending supports about 15 jobs.

#### **Value of 1999 impacts in 2004 dollars**

The 1999 economic impacts reported above were adjusted to 2004 impacts by multiplying 1999 figures by an average consumer price index of 1.21 (U.S. Department of Labor 2006). The results are presented in Table 17.

Table 17. Regional economic impacts of Hartwell Lake private dock owners'/users' trip and owners' annual spending (in 2004 dollars, for spending within 30 miles only).

Economic Measure	Trip Spending (within 30 miles)		Durable Goods and other Annual Costs Spent Locally	
<i>Total Spending (\$MM)</i>	\$69.48		\$14.80	
	Direct Effects	Total Effects	Direct Effects	Total Effects
<i>Output/sales (\$MM)</i>	\$44.09	\$72.05	\$9.44	\$15.93
<i>Total income (\$MM)</i>	\$16.39	\$25.85	\$3.61	\$5.92
<i>Total value added (\$MM)</i>	\$23.35	\$39.63	\$4.51	\$8.35
Note: Spending and economic effects in this table are in 2004 dollars, as opposed to the 1999 dollars reported elsewhere in this report.				

In 2004 dollars, total private dock user trip spending locally of \$69.5 million resulted in \$16.4 million in the region in personal income and \$23.4 million in value added (personal income + proprietor's income + indirect business tax). With secondary (multiplier) effects, total impacts locally were \$25.9 million in personal income and \$39.6 million in value added. There is no change to the number of direct jobs (819) in going from Tables 15 and 16 to Table 17. This is because no new expenditures by dock users are estimated in Table 17. Instead, expenditures from the 1999 survey are inflated to 2004 dollars. Since there are no new expenditures, no additional jobs were created in 2004.

After converting annual goods and services to 2004 dollars, the results are \$14.8 million in private dock owner spending on new boats, storage fees, insurance, and repairs/maintenance. The impacts of annual spending include \$3.6 million in personal income and \$4.5 million in value added. With secondary (multiplier) effects, total impacts locally were \$5.9 million in personal income and \$8.4 million in value added.

## 4 Study Limitations and Error

The accuracy of the estimates in this report rests on the three inputs: visits, spending averages, and multipliers. The number of trips reported by the sample of private dock owners and the number of boats at the docks are likely the largest potential sources of error.

The multipliers and economic ratios used to convert spending to jobs and income and to estimate secondary effects come from an IMPLAN model for the nine-county region in the state of Georgia only. Although it is difficult to estimate the levels of error, multipliers can vary by about 10 percent between different modeling systems. Multipliers largely influence estimates of secondary effects. Additionally, including the North Carolina and South Carolina counties will affect the multipliers.

Depending on the direction and magnitude of errors in visits, spending, and multipliers, the different errors may compound or cancel each other. The most important potential errors are in the estimates of total trips. As the model is linear, doubling the amount of visitation will double spending and economic impacts.

In addition to these issues, there are also conceptual issues regarding how much and which spending may be claimed by the project. It is not simple to determine if private dock users would spend their money elsewhere if private docks were not available at Hartwell Lake. Furthermore, local visitors are usually excluded in estimating economic impacts, but have been included here. Since they are not a distinct segment, their contribution to the total effects is not readily estimated. However, 61 percent of the dock owners interviewed stated that their permanent residences were within 30 miles of the project. Since approximately 79 percent of total trip spending occurred within 30 miles of the project, the impact of local spending cannot be ignored.

Only new boat purchases within 30 miles of the project are counted in this analysis. Further, it is assumed that dock maintenance fees and storage fees go primarily to local businesses. However, dock owners were not asked to identify the locations of their insurance companies or boat repair shops. Thus, the extent to which these expenditures accrue to the local economy is not known, but they have been counted as occurring locally (within the 16-county region).

## 5 Summary and Discussion

Private dock users at Hartwell Lake spent \$57.4 (\$69.5)<sup>1</sup> million in trip-related expenditures and \$12.2 (\$14.8) million in purchases of new boats and annual services within 30 miles of the lake in 1999. Combining both trip-related and durable expenditures, the direct economic effects of dock user spending were \$44.2 (\$53.5) million in sales, \$16.5 (\$20.0) million in personal income, \$23.0 (\$27.9) million in direct value added, and 819 jobs. With multiplier effects, created by the re-circulation of the money spent by dock users, visitor spending generated a total (direct + secondary) of \$72.7 (\$88.0) million in local sales, and an associated \$26.3 (\$31.8) million in personal income, \$39.7 (\$48.0) million in value added, and 1,177 jobs. Sectors receiving the greatest benefit from private dock users were food and drink, retail and wholesale trade, manufacturing, and services. The \$44 million in direct sales is about 2.9 percent of the total of all tourism activity (1.6 billion) (sales have been price-inflated for this computation).

Total economic impacts (Tables 15, 16, and 17) are useful for accountability purposes, lake support, and explaining the role of the lake in the region's economy. The REAS model results can also be used to evaluate management alternatives and strategies and to conduct sensitivity analyses. The marginal economic impacts of particular visitor segments are useful for evaluating particular actions. Table 18 shows the changes in sales, jobs, income, and valued added associated with an increase or decrease of 1,000 additional party-trips by each segment. Marginal impact analysis provides answers to the question: "What if?" (Reference Foreword.)

For example, to evaluate the regional economic impacts of adding an additional 17 private docks, first compute the change in party trips – 10 docks produce 617 party trips (average of 61.7 trips per dock per year from Table 3 times 10 docks). That means 17 new docks would produce about 1,000 extra party trips per year. Applying the average spending for the overnight segment in Table 9, the expansion generates an additional \$167,000 in total trip spending (\$167 per party trip from Table 9 times 1,000), \$106,000 dollars in direct sales in the region, \$39,000 in personal

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<sup>1</sup> Numbers in parentheses are in 2004 dollars (see Table 17).

income, \$56,000 in value added and 2.0 jobs in direct effects (computed from ratios in Table 15). In 2004 dollars, the extra 1,000 party trips per year by private dock users would result in \$128,000 in direct sales in the region and \$48,000 in direct personal income.<sup>1</sup> The impact of this alternative could be compared to others.

Table 18. Direct impacts of an additional 1,000 private dock owner party trips by segment, Hartwell Lake.

Segments	Local Spending (\$)	Direct Sales (\$)	Personal Income (\$)	Value Added (\$)	Jobs
<i>(Marginal impacts per 1,000 party-trips, in 1999 dollars)</i>					
Day use	\$62,442	\$39,629	\$14,731	\$20,987	0.8
Overnight stay	\$167,165	\$106,093	\$39,437	\$56,186	2.0
Small boat	\$111,241	\$70,600	\$26,243	\$37,389	1.4
Medium boat	\$112,818	\$71,601	\$26,615	\$37,919	1.4
Large boat	\$115,395	\$73,236	\$27,223	\$38,785	1.4
<i>(Marginal impacts per 1,000 party-trips, in 2004 dollars)</i>					
Day use	\$75,555	\$47,951	\$17,824	\$25,395	0.8
Overnight stay	\$202,270	\$128,372	\$47,718	\$67,985	2.0
Small boat	\$134,602	\$85,426	\$31,754	\$45,241	1.4
Medium boat	\$136,510	\$86,637	\$32,205	\$45,882	1.4
Large boat	\$139,627	\$88,616	\$32,940	\$46,930	1.4

The economic impacts presented in the report document the economic significance of 539,232 private dock owner trips at Hartwell Lake in 1999. The impacts will vary from year to year with changes in prices, visitor volumes, the mix of visitors attracted, and other changes in the lake and surrounding communities. The REAS model has built-in procedures to price-adjust spending averages over time, so updated figures may be obtained fairly easily, as done in this report, if there are not significant changes in visitor use and spending patterns. In the absence of significant structural changes in the local economy, multipliers will be quite stable. The primary input for updating the estimates is visitation, which must take into account any changes in the mix of visitors or their length of stay in the area.

<sup>1</sup> The number of jobs, 2.0, remains the same in 2004 because Table 18 reflects the marginal impacts of 1,000 additional party trips; since the ratio between sales and jobs remains the same between 1999 and 2004, the number of jobs per 1,000 additional party trips does not change.

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